New York State Integrated Pest Management Program

DEVELOPMENT OF CRUCIFER VEGETABLES WITH RESISTANCE TO BLACKROT AND ALTERNARIA LEAF SPOT

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Justification and Background

This project is developing materials with resistance to several serious diseases of crucifer vegetables in New York State: blackrot (caused by *Xanthomonas campestris* pv. *campestris*) and Alternaria leaf spot (caused by *A. brassicicola* and *A. brassicae*). Problems with *Alternaria* are increasing both in western New York State and along the East Coast. Chemical control is not very effective, so cultural practices and use of clean seed are currently used to limit disease damage. Host plant resistance could play an important role in reducing disease problems and use of pesticides.

Satisfactory resistance to blackrot and Alternaria disease is not available in *Brassica* vegetables, so we sought to utilize strong resistance to these diseases identified in other crucifer species. Virtual immunity to blackrot is available in a Chinese crucifer originally thought to be rapeseed (Guo et al. 1991) but now identified as *B. carinata*. This resistance is based on a single dominant gene. High tolerance to Alternaria is available in *Sinapis alba* lines from Israel (Hansen et al. 1995).

Sexual crosses of these resistance sources with *B. oleracea* have not been successful, so we combined the resistant lines with *B. oleracea* by protoplast fusion (Hansen and Earle 1995, 1997; Sigareva et al. 1999). Somatic hybrid plants resistant to blackrot or Alternaria were recovered from the fusion experiments. These somatic hybrids served as our starting material for obtaining horticulturally useful disease-resistant Brassica vegetables. Recovery of progeny from the first backcross of the resistant somatic hybrids to broccoli required embryo rescue; subsequent generations were recovered by standard crosses. Some of the progeny recovered continue to show resistance.

Results during 1998

1. Resistance to blackrot

Field trials of advanced lines derived from resistant somatic hybrids were conducted in 1996, 1997, and 1998 at Reeds' Seeds in Cortland, NY. The best materials identified each year were saved and used for recovery of seeds in the greenhouse.

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